Lawrence Co.

No

JUL 8 1977

Site: Syntex-Verona
ID #: MOD074521547
Break: 1.3
Other: MDNR
7.7.77

July 7, 1977

Missouri Department of Natural Resources
Division of Environmental Quality
P. O. Box 1368
Jefferson City, MO 65101

Attn.: Steve Townley

Ref.: Fish Kill June 9 or 10, Verona, Mo.

Dear Mr. Townley:

As per my letter of June 22 it was indicated that we would be receiving the results of our sampling. These are attached along with a sketch showing sample points. Sample 1 through 4 should correspond to the same samples as those taken by agent Tennyson. Samples 1 through 7 were taken about 2 PM June 10. Sample 8 was taken about 10 AM June 10.

The results would indicate a high nitrogen level in the drainage ditch. This would possibly confirm that the vacuum pump noted in my letter of June 22 was responsible. The operation for which their pump is used is experimental and the personnel operating the equipment at that time were not familiar with the piping involved. This pipe line was disconnected when it was discovered that the pump could be discharged directly to the drainage ditch. Since this operation is experimental, it is not possible to say positively that this was the cause. However, we have not been able to locate any other points of discharge. We do note that grass clippings are frequently present in this ditch and, as previously reported, some construction was taking place on nearby property. We also question why the contaminent would be present the following day, if in fact, the fish kill occurred the previous evening.

To improve our records we plan to sample the ditch more freqently and to assay for ammonia and related compounds.

We wish to thank Mr. Tennyson for his quick response to our request and for the professional way in which he handled the investigation.

Sincerely,

Gene Wallace
Engineering Manager

cc: R. Bagby
B. Glasgow
B. Zay

Attachment

7 50994

Dept. of Natural Resources - Spfld. Ofc.

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J. E. McClelland, P.E.

443-2377

74-502

SUMMARY OF RESULTS
WATER AND WASTE WATER ANALYSIS

To Mr. William Glasgow
Syntex Agribusiness, Inc.
Verona, Missouri 65769

Date 6-27-77

Sample Description Sample #1, 6/10/77

H (Standard Units)	7.4	Nitrate (as N)	2.3	Zinc	
olor (Units)		Nitrite (as N)	0.006	Mercury	
emperature		Total Nitrogen		Potassium	
pecific Conductance, Micromhos/cm		Phosphorus - Ortho (as P)		Cyanide	
urbidity (Jackson Units)	1	Phosphorus - Total (as P)	0.46	Arsenic	
cidity (total) as $CaCO_3$		Sulfate (as S)	2.07	Chloride	
lkalinity (total) as $CaCO_3$		Sulfide (as S)		Flouride	
ardness Total as $CaCO_3$		Chromium, Total		Volatile Acids (as Acetic Acid)	
otal Suspended Solids	5	Chromium, Hexavalent		Oil and Grease	
otal Dissolved Solids	172	Chromium, Trivalent		Phenols	
otal Solids	177	Copper		Surfactants	
otal Volatile Suspended Solids		Iron (Total)		Fecal Coliform Bacteria	
otal Volatile Dissolved Solids	74	Lead		Fecal Streptococci Bacteria	
otal Volatile Solids		Cadmium		Total Coliform Bacteria	
issolved Oxygen		Nickel			
OD (5-day, 20°C)	64	Aluminum			
OD	12	Magnesium			
mmonia (as N)	0.1023	Calcium			
jeldahl Nitrogen	2.85	Manganese			
rganic Nitrogen	2.75	Sodium			

results reported as mg/liter unless otherwise noted.

By Kevin Hatfield /cj
Kevin Hatfield
Chief Chemist

7 50994

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443-2377

SUMMARY OF RESULTS

WATER AND WASTE WATER ANALYSIS

To Mr. William Glasgow
Syntex Agribusiness, Inc.
Verona, Missouri 65769

Date 6-27-77

Sample Description Sample #2, 6/10/77

H (Standard Units)	9.6	Nitrate (as N)	1.4	Zinc	
olor (Units)		Nitrite (as N)	0.001	Mercury	
emperature		Total Nitrogen		Potassium	
pecific Conductance, Micromhos/cm		Phosphorus - Ortho (as P)		Cyanide	
urbidity (Jackson Units)	29	Phosphorus - Total (as P)	0.46	Arsenic	
cidity (total) as $CaCO_3$		Sulfate (as S)	4.74	Chloride	
lkalinity (total) as $CaCO_3$		Sulfide (as S)		Flouride	
ardness Total as $CaCO_3$		Chromium, Total		Volatile Acids (as Acetic Acid)	
otal Suspended Solids	48	Chromium, Hexavalent		Oil and Grease	
otal Dissolved Solids	236	Chromium, Trivalent		Phenols	
otal Solids	284	Copper		Surfactants	
otal Volatile Suspended Solids		Iron (Total)		Fecal Coliform Bacteria	
otal Volatile Dissolved Solids	88	Lead		Fecal Streptococci Bacteria	
otal Volatile Solids		Cadmium		Total Coliform Bacteria	
issolved Oxygen		Nickel			
OD (5-day, 20°C)	323	Aluminum			
OD	611	Magnesium			
mmonia (as N)	179	Calcium			
jeldahl Nitrogen	183	Manganese			
rganic Nitrogen	4	Sodium			

results reported as mg/liter unless otherwise noted.

By Kevin Hatfield

Kevin Hatfield
Chief Chemist

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SUMMARY OF RESULTS
WATER AND WASTE WATER ANALYSIS

To Mr. William Glasgow
Syntex Agribusiness, Inc.
Verona, Missouri 65769

Date June 27, 1977

Sample Description Sample #3, 6/10/77

Standard Units)	9.2	Nitrate (as N)	1.1	Zinc	
r (Units)		Nitrite (as N)	0.0085	Mercury	
perature		Total Nitrogen		Potassium	
ific Conductance, Micromhos/cm		Phosphorus - Ortho (as P)		Cyanide	
idity (Jackson Units)	135	Phosphorus - Total (as P)	0.87	Arsenic	
lity (total) as $CaCO_3$		Sulfate (as S)	4.94	Chloride	
linity (total) as $CaCO_3$		Sulfide (as S)		Flouride	
dness Total as $CaCO_3$		Chromium, Total		Volatile Acids (as Acetic Acid)	
l Suspended Solids	532	Chromium, Hexavalent		Oil and Grease	
l Dissolved Solids	150	Chromium, Trivalent		Phenols	
l Solids	682	Copper		Surfactants	
l Volatile Suspended Solids		Iron (Total)		Fecal Coliform Bacteria	
l Volatile Dissolved Solids	64	Lead		Fecal Streptococci Bacteria	
l Volatile Solids		Cadmium		Total Coliform Bacteria	
solved Oxygen		Nickel			
(5-day, 20°C)	232	Aluminum			
	370	Magnesium			
nonia (as N)	27.7	Calcium			
dahl Nitrogen	49.50	Manganese			
anic Nitrogen	21.8	Sodium			

esults reported as mg/liter unless otherwise noted.

By Kevin Hatfield
Kevin Hatfield
Chief Chemist

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SUMMARY OF RESULTS
WATER AND WASTE WATER ANALYSIS

To Mr. William Glasgow
Syntex Agribusiness, Inc.
Verona, Missouri 65769

Date June 27, 1977

Sample Description Sample #4, 6/10/77

(Standard Units)	7.8	Nitrate (as N)	2.6	Zinc	
or (Units)		Nitrite (as N)	0.009	Mercury	
nperature		Total Nitrogen		Potassium	
cific Conductance, Micromhos/cm		Phosphorus - Ortho (as P)		Cyanide	
bidity (Jackson Units)	3	Phosphorus - Total (as P)	0.04	Arsenic	
dity (total) as $CaCO_3$		Sulfate (as S)	2.07	Chloride	
alinity (total) as $CaCO_3$		Sulfide (as S)		Flouride	
dness Total as $CaCO_3$		Chromium, Total		Volatile Acids (as Acetic Acid)	
al Suspended Solids	7	Chromium, Hexavalent		Oil and Grease	
al Dissolved Solids	212	Chromium, Trivalent		Phenols	
al Solids	219	Copper		Surfactants	
al Volatile Suspended Solids		Iron (Total)		Fecal Coliform Bacteria	
al Volatile Dissolved Solids	82	Lead		Fecal Streptococci Bacteria	
al Volatile Solids		Cadmium		Total Coliform Bacteria	
solved Oxygen		Nickel			
D (5-day, 20°C)	2	Aluminum			
D	8	Magnesium			
monia (as N)	5.44	Calcium			
ldahl Nitrogen	5.8	Manganese			
anic Nitrogen	0.4	Sodium			

esults reported as mg/liter unless otherwise noted.

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By Kevin Hatfield
Kevin Hatfield
Chief Chemist

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SUMMARY OF RESULTS
WATER AND WASTE WATER ANALYSIS

To Mr. William Glasgow
Syntex Agribusiness, Inc.
Verona, Missouri 65769

Date June 27, 1977

Sample Description Sample #5, 6/10/77

(Standard Units)	7.5	Nitrate (as N)	2.3	Zinc	
ior (Units)		Nitrite (as N)	0.009	Mercury	
mperature		Total Nitrogen		Potassium	
ecific Conductance, Micromhos/cm		Phosphorus - Ortho (as P)	< 0.02	Cyanide	
bidity (Jackson Units)	1	Phosphorus - Total (as P)		Arsenic	
idity (total) as $CaCO_3$		Sulfate (as S)	2.67	Chloride	
alinity (total) as $CaCO_3$		Sulfide (as S)		Flouride	
rdness Total as $CaCO_3$		Chromium, Total		Volatile Acids (as Acetic Acid)	
tal Suspended Solids	6	Chromium, Hexavalent		Oil and Grease	
tal Dissolved Solids	236	Chromium, Trivalent		Phenols	
tal Solids	242	Copper		Surfactants	
tal Volatile Suspended Solids		Iron (Total)		Fecal Coliform Bacteria	
tal Volatile Dissolved Solids	104	Lead		Fecal Streptococci Bacteria	
tal Volatile Solids		Cadmium		Total Coliform Bacteria	
ssolved Oxygen		Nickel			
OD (5-day, 20°C)	<1	Aluminum			
OD	4	Magnesium			
mmonia (as N)	6.33	Calcium			
eldahl Nitrogen	6.75	Manganese			
ganic Nitrogen	0.4	Sodium			

results reported as mg/liter unless otherwise noted.

By Kevin Hatfield
Kevin Hatfield
Chief Chemist

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SUMMARY OF RESULTS
WATER AND WASTE WATER ANALYSIS

To Mr. William Glasgow
Syntex Agribusiness
Verona, Missouri 65769

Date June 27, 1977

Sample Description Sample #6, 6/10/77

(Standard Units)	7.6	Nitrate (as N)	2.3	Zinc	
lor (Units)		Nitrite (as N)	0.0125	Mercury	
nperature		Total Nitrogen		Potassium	
ecific Conductance, Micromhos/cm		Phosphorus - Ortho (as P)		Cyanide	
bidity (Jackson Units)	2	Phosphorus - Total (as P)	< 0.02	Arsenic	
idity (total) as $CaCO_3$		Sulfate (as S)	1.75	Chloride	
alinity (total) as $CaCO_3$		Sulfide (as S)		Flouride	
rdness Total as $CaCO_3$		Chromium, Total		Volatile Acids (as Acetic Acid)	
tal Suspended Solids	7	Chromium, Hexavalent		Oil and Grease	
al Dissolved Solids	210	Chromium, Trivalent		Phenols	
tal Solids	217	Copper		Surfactants	
tal Volatile Suspended Solids		Iron (Total)		Fecal Coliform Bacteria	
al Volatile Dissolved Solids	78	Lead		Fecal Streptococci Bacteria	
al Volatile Solids		Cadmium		Total Coliform Bacteria	
solved Oxygen		Nickel			
D (5-day, 20°C)	<1	Aluminum			
D	8	Magnesium			
monia (as N)	0.214	Calcium			
ldahl Nitrogen	2.40	Manganese			
anic Nitrogen	2.2	Sodium			

Results reported as mg/liter unless otherwise noted.

By Kevin Hatfield
Kevin Hatfield
Chief Chemist

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SUMMARY OF RESULTS
WATER AND WASTE WATER ANALYSIS

To Mr. William Glasgow
Syntex Agribusiness, Inc.
Verona, Missouri 65769

Date June 27, 1977

Sample Description Sample #7, 6/10/77

(Standard Units)	9.6	Nitrate (as N)	2.45	Zinc	
or (Units)		Nitrite (as N)	0.006	Mercury	
mperature		Total Nitrogen		Potassium	
cific Conductance, Micromhos/cm		Phosphorus - Ortho (as P)		Cyanide	
bidity (Jackson Units)	32	Phosphorus - Total (as P)	0.58	Arsenic	
idity (total) as $CaCO_3$		Sulfate (as S)	5.19	Chloride	
alinity (total) as $CaCO_3$		Sulfide (as S)		Flouride	
rdness Total as $CaCO_3$		Chromium, Total		Volatile Acids (as Acetic Acid)	
tal Suspended Solids	57	Chromium, Hexavalent		Oil and Grease	
tal Dissolved Solids	246	Chromium, Trivalent		Phenols	
tal Solids	303	Copper		Surfactants	
tal Volatile Suspended Solids		Iron (Total)		Fecal Coliform Bacteria	
tal Volatile Dissolved Solids	82	Lead		Fecal Streptococci Bacteria	
al Volatile Solids		Cadmium		Total Coliform Bacteria	
solved Oxygen		Nickel			
D (5 day, 20°C)	315	Aluminum			
D	500	Magnesium			
monia (as N)	168	Calcium			
ldahl Nitrogen	173	Manganese			
anic Nitrogen	5	Sodium			

esults reported as mg/liter unless otherwise noted.

By Kevin Hatfield
Kevin Hatfield
Chief Chemist

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SUMMARY OF RESULTS
WATER AND WASTE WATER ANALYSIS

To Mr. William Glasgow
Syntex Agribusiness, Inc.
Verona, Missouri 65769

Date June 27, 1977

Sample Description Sample #8, 6/10/77

(Standard Units)	7.9	Nitrate (as N)	2.9	Zinc	
or (Units)		Nitrite (as N)	0.022	Mercury	
mperature		Total Nitrogen		Potassium	
ecific Conductance, Micromhos/cm		Phosphorus - Ortho (as P)		Cyanide	
bidity (Jackson Units)	2	Phosphorus - Total (as P)	0.04	Arsenic	
idity (total) as $CaCO_3$		Sulfate (as S)	2.67	Chloride	
alinity (total) as $CaCO_3$		Sulfide (as S)		Flouride	
rdness Total as $CaCO_3$		Chromium, Total		Volatile Acids (as Acetic Acid)	
tal Suspended Solids	6	Chromium, Hexavalent		Oil and Grease	
tal Dissolved Solids	208	Chromium, Trivalent		Phenols	
tal Solids	214	Copper		Surfactants	
tal Volatile Suspended Solids		Iron (Total)		Fecal Coliform Bacteria	
tal Volatile Dissolved Solids	74	Lead		Fecal Streptococci Bacteria	
tal Volatile Solids		Cadmium		Total Coliform Bacteria	
ssolved Oxygen		Nickel			
D (5-day, 20°C)	< 1	Aluminum			
D	4	Magnesium			
mmonia (as N)	6.27	Calcium			
eldahl Nitrogen	8.5	Manganese			
ganic Nitrogen	2.3	Sodium			

esults reported as mg/liter unless otherwise noted.

By Kevin Hatfield
Kevin Hatfield
Chief Chemist

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SUMMARY OF RESULTS
WATER AND WASTE WATER ANALYSIS

To Mr. William Glasgow
Syntex Agribusiness, Inc.
Verona, Missouri 65769

Date June 27, 1977

Sample Description Sample #9, 6/10/77

H (Standard Units)	8.6	Nitrate (as N)	0.6	Zinc	
olor (Units)		Nitrite (as N)	0.026	Mercury	
emperature		Total Nitrogen		Potassium	
pecific Conductance, Micromhos/cm		Phosphorus - Ortho (as P)		Cyanide	
urbidity (Jackson Units)	<1	Phosphorus - Total (as P)	<0.02	Arsenic	
cidity (total) as $CaCO_3$		Sulfate (as S)	4.0	Chloride	
lkalinity (total) as $CaCO_3$		Sulfide (as S)		Flouride	
ardness Total as $CaCO_3$		Chromium, Total		Volatile Acids (as Acetic Acid)	
otal Suspended Solids	6	Chromium, Hexavalent		Oil and Grease	
otal Dissolved Solids	230	Chromium, Trivalent		Phenols	
otal Solids	236	Copper		Surfactants	
otal Volatile Suspended Solids		Iron (Total)		Fecal Coliform Bacteria	
otal Volatile Dissolved Solids	100	Lead		Fecal Streptococci Bacteria	
otal Volatile Solids		Cadmium		Total Coliform Bacteria	
issolved Oxygen		Nickel			
OD (5-day, 20°C)	8	Aluminum			
OD	8	Magnesium			
mmonia (as N)	3.96	Calcium			
eldahl Nitrogen	4.20	Manganese			
ganic Nitrogen	0.3	Sodium			

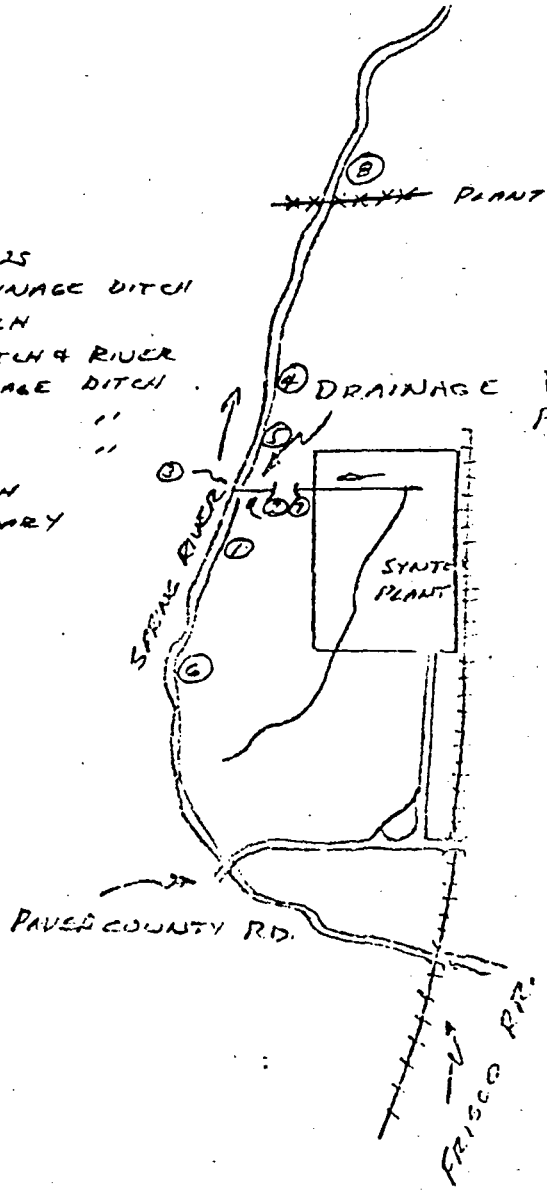
results reported as mg/liter unless otherwise noted.

By Kevin Hatfield
Kevin Hatfield
Chief Chemist

7 50994

SAMPLE LOCATIONS

① ~ 200' S. OF DRAINAGE DITCH
② IN DRAINAGE DITCH
③ CONFLUENCE OF DITCH & RIVER
④ ~100' N. OF DRAINAGE DITCH
⑤ ~ 50' N. " " "
⑥ ~ 500' S. " " "
⑦ IN DRAINAGE DITCH
⑧ N. OF PLANT BOUNDARY



SYNTEX VERONA PLANT
JUNE 20, 1977

NOT TO SCALE

7 50994

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J. E. McClelland, P.E.

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SUMMARY OF RESULTS

WATER AND WASTE WATER ANALYSIS

74-502

To

Mr. William D. Glasgow
Syntex Agribusiness, Inc.
Verona, Missouri 65806

Date December 28, 1977

Sample Description NPDES Point #001, Received 12/19/77

pH (Standard Units)	8.3	Nitrate (as N)	Zinc
Color (Units)		Nitrite (as N)	Mercury
Temperature		Total Nitrogen	Potassium
Specific Conductance, Micromhos/cm		Phosphorus - Ortho (as P)	Cyanide
Turbidity (Jackson Units)		Phosphorus - Total (as P)	Arsenic
Acidity (total) as $CaCO_3$		Sulfate (as S)	Chloride
Alkalinity (total) as $CaCO_3$		Sulfide (as S)	Flouride
Hardness Total as $CaCO_3$		Chromium, Total	Volatile Acids (as Acetic Acid)
Total Suspended Solids	10	Chromium, Hexavalent	Oil and Grease
Total Dissolved Solids		Chromium, Trivalent	Phenols
Total Solids		Copper	Surfactants
Total Volatile Suspended Solids		Iron (Total)	Fecal Coliform Bacteria
Total Volatile Dissolved Solids		Lead	Fecal Streptococci Bacteria
Total Volatile Solids		Cadmium	Total Coliform Bacteria
Dissolved Oxygen		Nickel	Total Set. Solids < 0.1 ml/l
BOD (5-day, 20°C)		Aluminum	
COD		Magnesium	
Ammonia (as N)		Calcium	
Kjeldahl Nitrogen		Manganese	
Organic Nitrogen		Sodium	

results reported as mg/liter unless otherwise noted.

7 50999

By

Kevin Hatfield
Chief Chemist

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SUMMARY OF RESULTS
WATER AND WASTE WATER ANALYSIS

74-502

To
Mr. William D. Glasgow
Syntex Agribusiness, Inc.
Verona, MO 65769

Date
January 11, 1978

Sample Description NPDES Discharge #001, Received 12/29/77

H (Standard Units) 10.0	Nitrate (as N)	Zinc
olor (Units)	Nitrite (as N)	Mercury
emperature	Total Nitrogen	Potassium
ecific Conductance, Micromhos/cm	Phosphorus - Ortho (as P)	Cyanide
rbidity (Jackson Units)	Phosphorus - Total (as P)	Arsenic
cidity (total) as $CaCO_3$	Sulfate (as S)	Chloride
kalinity (total) as $CaCO_3$	Sulfide (as S)	Flouride
ardness Total as $CaCO_3$	Chromium, Total	Volatile Acids (as Acetic Acid)
otal Suspended Solids 137	Chromium, Hexavalent	Oil and Grease
otal Dissolved Solids	Chromium, Trivalent	Phenols
otal Solids	Copper	Surfactants
otal Volatile Suspended Solids	Iron (Total)	Fecal Coliform Bacteria
otal Volatile Dissolved Solids	Lead	Fecal Streptococci Bacteria
otal Volatile Solids	Cadmium	Total Coliform Bacteria
ssolved Oxygen	Nickel	Total Set. Solids 0.9 ml/l
OD (5-day, 20°C)	Aluminum	
OD	Magnesium	
mmonia (as N)	Calcium	
eldahl Nitrogen	Manganese	
ganic Nitrogen	Sodium	

esults reported as mg/liter unless otherwise noted.

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By Kevin Hatfield
Kevin Hatfield
Chief Chemist